

## FOUR NEW AND TWO UNRECORDED SPECIES OF DROSOPHILIDAE FROM INDIA (INSECTA : DIPTERA)

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THREE TEXT-FIGURES

### Abstract

Taxonomic account of six species representing five genera of the Drosophilidae is provided. Among them, *Zaprionus (Aprionus) cercociliaris*, *Liodrosophila minidenta*, *Drosophila (Lordiphosa) himalayana* and *Microdrosophila (Microdrosophila) gangtokensis* are new to science, while *Scaptomyza (Scaptomyza) parasplendens* and *Drosophila (Scaptodrosophila) spinomelana* are recorded for the first time from India.

### Introduction

The Drosophilidae is a large family of world-wide distribution. Our recent surveys in northeastern parts of the Indian subcontinent have yielded considerable data on the Indian Drosophilidae (Singh and Gupta, 1977; Gupta and Singh, 1979; Dwivedi *et al.*, 1979; Dwivedi and Gupta, 1979, 1980; Gupta and Kumar, 1986; Kumar and Gupta, 1988; Gupta and Gupta, 1989, 1990, 1990). This paper deals with the results of our further survey work carried out in this region of the Indian subcontinent.

The type-specimens are deposited in the "Drosophila collection" of the Department of Zoology, Banaras Hindu University, Varanasi, India, and Department of Biology, Tokyo Metropolitan University, Tokyo, Japan.

### Material and Methods

The flies for the present study were collected from several different geographic localities in Arunachal Pradesh and Sikkim. The collections were largely made by using both trap-bait and net-sweeping methods. A variety of fermenting fruits such as banana, pine apple and orange were used as baits in order to obtain a wide spectrum of species. The collected flies were preserved in 70% alcohol on the spot. The taxonomic studies were made following the procedure adopted by Gupta (1969).

### Taxonomic Account

#### *Zaprionus (Aprionus) cercociliaris* n.sp.

Average body length: 2.52 mm (Male) and 2.71 mm (Female).

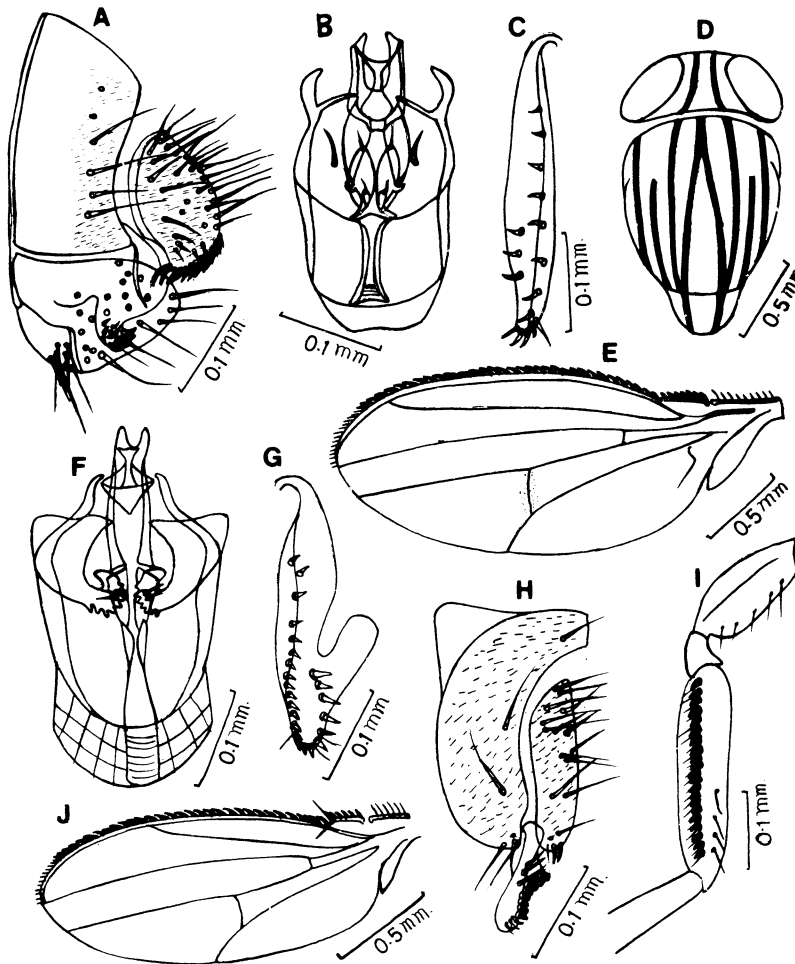
#### Male and Female

*Head*: Arista with 2-3 dorsal and one ventral branches in addition to the small terminal fork. Antennae with second segment brown: third segment little lighter. Frons including ocellar triangle pale brown, with dark stripe along orbits. Orbital bristles in ratio 8:3:6, anterior reclinate placed in between other two orbitals. Vibrissa single, strong, with black base. Palpus dark

brown, slender, with one prominent apical seta. Carina dark brown, narrow and high. Face and cheek yellowish brown, cheek at margin darker; greatest width of cheek  $1/6$  greatest diameter of eye. Clypeus brownish. eyes dark red, with short pile.

**Thorax:** Acrostichal hair in 4 regular rows. Anterior scutellars convergent; posterior ones crossed. Distance between anterior and posterior dorsocentral bristles  $1/2$  the distance between anterior dorsocentrals. Mesonotum pale yellow, with 8 brownish black longitudinal stripes, middle two stripes uniting anteriorly and diverging posteriorly, one pair of sublateral stripes extending upto the head; penultimate lateral stripes not complete and reaching only to suture (Text-fig. 1D). Thoracic pleura pale yellow, with three dark brown stripes. Sterno-index 0.6.

**Legs:** Pale yellow, preapicals on all tibiae; apicals on fore- and mid-tibiae. Femora, distal end of tibiae and terminal tarsal segments of fore legs much darker in male than in female.



TEXT-FIGURE 1. *Zaprionus (Aprionus) cercociliaris* Gupta and Gupta (A-E). A, Periphallic organs; B, Phallic organs; C, Egg-guide; D, Thorax; E, Male wing.

*Liodrosophila minidenta* Gupta and Gupta (F-I). F, Phallic organs; G, Egg-guide; H, Periphallic organs; I, Male fore leg; J, Male wing.

**Wings** (Text-fig. 1E): Clear, posterior cross-vein mildly fuscous. Wing-vein indices: C-index 3.23-3.26; 4V-index 1.7; 4C-index 0.72-0.85; 5X-index 0.95. C<sub>3</sub> fringe 0.26. Haltere stalk light brown and knob whitish. Wing length 2.5 mm.

**Abdomen:** Yellow, tergites with medially and laterally interrupted dark brown bands.

**Periphallial organs** (Text-fig. 1A): Epandrium broad below, pubescent, upper portion with about 6 bristles; lower portion with numerous bristles. Surstylus embedded in the epandrium, with 4 black teeth and several fine setae. Cercus broad, separated from epandrium, with about 30 long bristles above and numerous strong black setae on entire ventral margin.

**Phallic organs** (Text-fig. 1B): Aedeagus apically bilobed, medially swollen, basal apodeme of aedeagus short. anterior gonapophysis small, with one small apical sensillum. Novasternum with narrow sub-median processes and a pair of submedian spines. Ventral fragma quadrate.

**Egg-guide** (Text-fig. 1C): Lobe slender, with about 12 marginal and 3 discal teeth.

**Holotype** ♂ : INDIAN, SIKKIM, Gangtok, November, 1988. Coll. K. K. Gupta and J. P. Gupta. Paratypes 6♂♂, 4♀♀, same data as holotype.

**Relationships:** This species superficially resembles *Z. multistriatus* (Duda) 1923, but distinctly differs from it in having mesoscutum pale yellow with 8 brownish black longitudinal stripes (mat grayish yellow with 6 stripes in *multistriatus*), cercus with numerous strong black setae on entire ventral margin (absent in *multistriatus*) and surstylus with 4 black teeth (12 in *multistriatus*).

**Distribution:** India.

### *Liodrosophila minidenta* n.sp.

Average body length : 1.78 mm (Male), 2.0 mm (Female).

#### Male and Female

**Head:** Arista with 4-5 dorsal and 2 ventral branches in addition to the small terminal fork. Antennae with second segment brown; third segment pale brown. Frons including ocellar triangle brownish black, glossy. Orbital bristles in ratio 7:2:9. Vibrissa large. Palpus pale brown, with one large apical seta and several small marginal setae. Carina brown, narrow and high. Face and cheek yellowish brown, greatest width of cheek 1/4 greatest diameter of eye. Clypeus brown. Eyes dark red.

**Thorax:** Acrostichal hair in 6 regular rows. Anterior scutellars thin, smaller than posterior scutellars; posterior scutellars large, convergent. Distance between anterior and posterior dorsocentral bristles 1/2 the distance between two anterior dorsocentrals. Mesonotum and scutellum pale brown to dark brown, glossy. Thoracic pleura brownish.

**Legs** (Text-fig. 1I): Pale brown, fore femur with about 21 spinules, a fine hair arising from the base of each spinule. Preapicals on all three tibiae; apicals on fore- and mid-tibiae.

**Wing** (Text-fig. 1J): Clear. Wing-vein indices: C-index 1.30-1.47; 4V-index 2.11; 4C-index 1.66; 5X-index 1.25-1.4. C<sub>3</sub> fringe 0.61-0.68. Two equal bristles at the apex of first costal section. Haltere yellowish. Wing length 1.74-1.86 mm.

**Abdomen:** Uniformly dark brown, with metallic lusture.

**Periphallial organs** (Text-fig. 1H): Epandrium dark brown, pubescent, upper portion with

3 bristles; lower portion with 4 bristles. Surstylus long, narrow, with 8 apically blunt small teeth arranged in a concave row, 3 large setae on dorsal surface and several fine setae below. Cercus oblong, with about 15 large bristles above and 2 small stout setae at lower tip.

*Phallic organs* (Text-fig. 1F): Aedeagus straight, apically concaved, subapically with a dorsal triangular process. Anterior gonapophysis minute, with two apical sensilla. Novasternum forming triangular processes, with inner margin having smaller serrations. Ventral fragma nearly quadrate.

*Egg-guide* (Text-fig. 1G): Lobe pale yellow, elongate, medially swollen, with 19 marginal and 4 discal teeth.

*Holotype* ♂ : INDIA, ARUNACHAL PRADESH, West Siang District, Basar, April, 1988. Coll. K. K. Gupta and J. P. Gupta. Paratypes: 5♂♂, 7♀♀, same data as holotype.

*Relationships*: This species superficially resembles *L. onchopyga* (Okada, 1966), but clearly differs from it in having surstylus with 8 marginal black teeth (14 in *onchopyga*) and a fine hair arising from the base of each spinule on fore femur (absent in *onchopyga*).

*Distribution*: India.

***Microdrosophila (Microdrosophila) gangtokensis* n.sp.**

Average body length: 2.3 mm (Male).

**Male**

*Head*: Arista with 6 dorsal and 2 ventral branches in addition to the terminal fork. Antennae with second segment brown; third segment whitish yellow. Frons pale, ocellar triangle brownish. Orbitals in ratio 4:1:5, anterior reclinate very minute. Vibrissa single, strong. Palpus dark brown, with 2-3 prominent setae. Carina light-brown, narrow and high. Face and cheek yellowish; greatest width of cheek 1/5 greatest diameter of eye. Eyes dark red.

*Thorax*: Acrostichal hair in 8 rows. Anterior and posterior scutellars divergent. Distance between anterior and posterior dorsocentral bristles 3/4 the distance between two anterior dorsocentrals. Mesonotum and scutellum with three dark brown longitudinal stripes, median stripe not complete. Thoracic pleura with a brown, broad longitudinal stripe. Sterno-index 0.8.

*Legs*: Whitish yellow, preapicals on all three tibiae; apicals on fore- and mid-tibiae.

*Wings* (Text-fig. 2D): Dusky. Wing-vein indices: C-index 1.13; 4V-index 3.6; 4C-index 2.58; 5X-index 2.75. C<sub>3</sub> fringe 0.93. Haltere brown.

*Abdomen*: Completely dark brown.

*Periphallid organs* (Text-fig. 2A): Epandrium broad, with elongate process at heel. Cercus fused to epandrium.

*Phallic organs* (Text-fig. 2B-C): Aedeagus broad and globular, apodeme rod shaped. Anterior gonapophysis large, apically broadened and with several sensilla.

*Holotype* ♂ : INDIA, SIKKIM, Gangtok, April, 1988. Coll. K. K. Gupta and J. P. Gupta, Paratypes 3♂♂, same data as holotype.

*Relationships*: This species superficially resembles *M. rhoparia* (Okada, 1985), but

distinctly differs from it in having epandrium with elongate process at heel (epandrium elongate below in *rhoparia*), mesonotum and scutellum with three dark brown longitudinal stripes (dark brownish black in *rhoparia*).

*Distribution* : India.

***Drosophila (Lordiophosa) himalayana* n.sp.**

Body length: 2.34 mm (Male), 2.42 mm (Female).

**Male and Female**

*Head*: Arista with 4-5 dorsal and 2 ventral branches in addition to terminal fork. Antennae with second segment brown; third segment little lighter. Frons pale brown. Orbitals in ratio 4:2:7; anterior reclinate close to proclinate. Oral two, subequal. Palpus brown, with one large apical seta. Face and cheek yellowish; the greatest width of cheek 1/4 greatest diameter of eye. Clypeus brown. eyes red.

*Thorax*: Acrostichal hair in 6 rows. Anterior scutellars nearly divergent; Posterior scutellars convergent. Distance between anterior and posterior dorsocentrals 1/2 the distance between two anterior dorsocentrals. Mesonotum yellowish, with two broad, dark brown lateral stripes. Scutellum yellowish, lateral margin brownish. Thoracic pleura brownish, yellowish stripe below wing articulation.

*Legs*: Yellowish, preapicals on all three tibiae; apicals on fore- and mid-tibiae.

*Wings*(Text-fig. 2G): Clear posterior cross vein mildly fuscous. Wing-vein indices: C-index 3.3; 4V-index 1.95; 4C-index 0.8; 5X-index 1.3. C<sub>3</sub> fringe 0.42. Haltere white.

*Abdomen*: Completely dark brown.

*Periphallid organs*(Text-fig. 2E): Epandrium ventrally much elongated, with 4 long bristles, upper portion with 7 bristles. Surstylus with 9 large marginal black teeth and several small bristles below. Cercus elongate, narrowing ventrally and 5 black setae, upper portion with about 16 bristles..

*Phallic organs*(Text-fig. 2F): Black. Anterior gonapophysis elongate, apically hairy. Ventral fragma triangular.

*Holotype* ♂ : INDIA SIKKIM, Gangtok, November, 1988. Coll. K. K. Gupta and J. P. Gupta. Paratypes 2 ♂♂, same data as holotype.

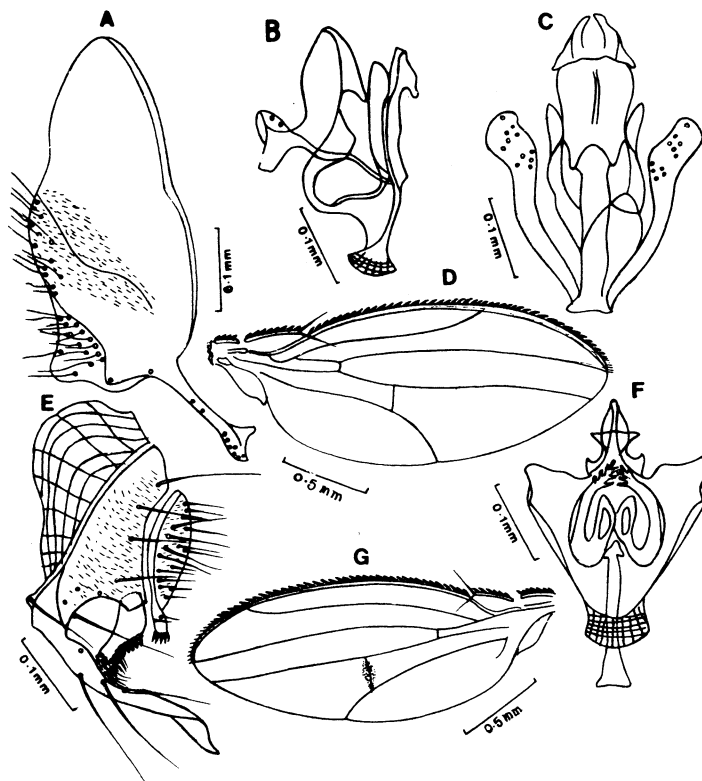
*Relationships*: This species closely resembles *D. (Lordiophosa) porrecta* (Okada, 1984), but clearly differs from it in having mesonotum with two broad dark brown lateral stripes (subshiny gray brown in *porrecta*), epandrium ventrally much elongated and subapically without a strong tooth (strong tooth present in *porrecta*) and cercus ventrally with 5 black setae (3 in *porrecta*).

*Distribution* : India.

***Scaptomyza (Scaptomyza) parasplendens* Okada**

*Scaptomyza (Scaptomyza) parasplendens* Okada, 1966, Bull. Brit. Mus. (nat. Hist.), Ent. Suppl. 6: 3-129.

**Male and Female**: General features as described by Okada (1966).



TEXT-FIGURE 2. *Microdrosophila (Microdrosophila) gangtokensis* Gupta and Gupta (A-D). A, Periphallallic organs; B, Phallic organs (Lateral view); C, Phallic organs; D, Male wing.

*Drosophila (Lordiphosa) himalayana* Gupta and Gupta (E-G), E, Periphallallic organs; F, Phallic organs; G, Male wing.

**Periphallic organs** (Text-fig. 3B): Epandrium brownish black, broad, with about 7 bristles on lower portion. Surstylus brownish black, triangular, with a row of about 14 marginal black teeth and a setae. Cercus brownish black, large, with about 28 bristles.

**Phallic organs** (Text-fig. 3A): Aedeagus yellowish, oblong. Anterior gonapophysis small, with 2 apical sensilla. Ventral fragma triangular.

**Egg-guide** (Text-fig. 3D): Lobe brownish black, robust with about 24 marginal and 18 discal teeth.

**Specimen examined**: INDIA, SIKKIM, Gangtok, 11 ♂♂, 7 ♀♀, November, 1988.

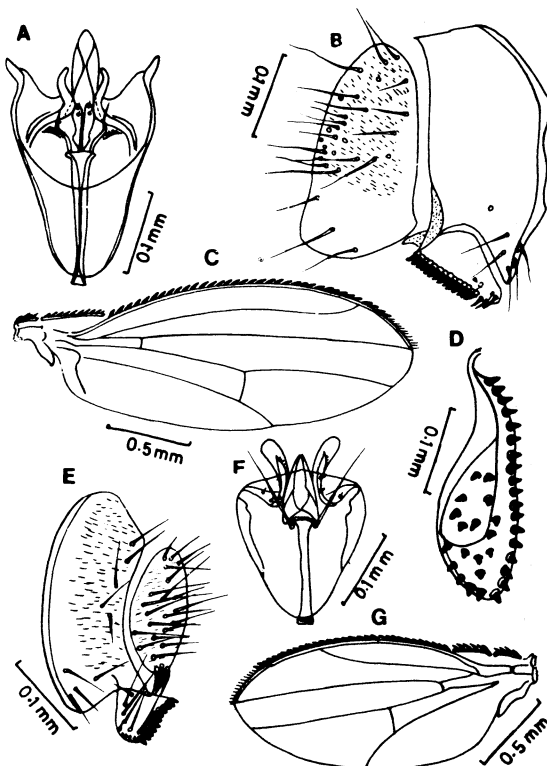
**Distribution**: India.

*Drosophila (Scaptodrosophila) spinomelana* Okada and Carson

*Dorsophila (Scaptodrosophila) spinomelana* Okada and Carson, 1983, Int. J. Entomology, 25(2-3): 127-141.

Male and Female : General features as described by Okada and Carson (1983).

**Periphallic organs** (Text-fig. 3E): Epandrium with about 9 marginal bristles. Cercus with about 20 bristles and 3 tough black setae below. Surstylus somewhat triangular, with a row of about 11 small marginal black teeth and 4-5 secondary bristles.



TEXT-FIGURE 3. *Scaptomyza (Scaptomyza) parasplendens* Okada (A-D). A, Phallic organs; B, Periphallic organs; C, Male wing; D, Egg-guide.

*Drosophila (Scaptodrosophila) spinomelana* Okada and Carson (E-G). E, Periphallic organs; F, Phallic organs; G, Male wing.

*Phallic organs* (Text-fig. 3F): Aedeagus narrowing apically and pointed. Anterior gonapophysis large, apically rounded and with a few basal sensilla. Novasternum with a pair of long submedian spines. Ventral fragma triangular.

*Specimen examined*: INDIA, ARUNACHAL PRADASH, West Siang District, Basar, 2♂, 1♀, April, 1988.

*Distribution*: New Guinea, India (New record).

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